

Amendment dated May 2, 2012

Reply to Office Action of February 24, 2012

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A driving apparatus for a washing machine, comprising:
a tub which contains configured to contain washing water, and receives receive a drum such that the drum is rotatable therein;
a dual rotor which that includes an outer rotor including a plurality of magnets supported by an inner peripheral surface of the outer rotor, and an inner rotor arranged inside the outer rotor, the inner rotor including a plurality of magnets supported by an outer peripheral surface of the inner rotor;
a bearing housing which is formed at a rear wall of the tub in accordance with an insert molding method such that the bearing housing is integral with the tub, the bearing housing rotatably supporting a drum shaft connecting that connects the drum and the dual rotor;
a motor mounting bracket which is mounted to the rear wall of the tub; and
a stator which is mounted to the rear wall of the tub via the motor mounting bracket such that the stator is arranged between the outer rotor and the inner rotor, the stator generating magnetic energy using electrical energy supplied from an external of the stator, to rotate and rotates the dual rotor; and
an auxiliary bracket interposed between the stator and the motor mounting bracket.

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2. (Currently Amended) The driving apparatus according to claim 1, wherein the stator includes:

a core arranged such that opposite surfaces of the core face the plurality of magnets of the outer rotor and the plurality of magnets of the inner rotor, respectively;

an insulator made of an insulating material, the insulator enclosing the core;

a plurality of coils wound around the insulator;

a molded member formed in accordance with an insert molding method to enclose that encloses the insulator and the plurality of coils such that the molded member is integral with the insulator and the plurality of coils while allowing the opposite surfaces of the core to be exposed; and

a coupling member extending that extends from the molded member, the coupling portion member being mounted to the rear wall of the tub via the motor mounting bracket.

3. (Currently Amended) The driving apparatus according to claim 1, wherein the stator includes:

a core arranged such that opposite surfaces of the core face the plurality of magnets of the outer rotor and the plurality of magnets of the inner rotor, respectively;

an insulator enclosing the core;

a plurality of coils wound around the insulator; and

a coupling member extending that extends from the molded member, the coupling

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member being mounted to the rear wall of the tub via the motor mounting bracket.

4. (Currently Amended) The driving apparatus according to claim 1, further comprising:

a plurality of bracket mounting bosses formed at the rear wall of the tub; and

a plurality of outer coupling holes formed through the motor mounting bracket such that the plurality of outer coupling holes correspond corresponds to the plurality of bracket mounting bosses, respectively, whereby wherein the motor mounting bracket is mounted to the tub when by a plurality of bolts are fastened through the plurality of bracket mounting bosses of the tub and the plurality of outer coupling holes of the motor mounting bracket.

5. (Currently Amended) The driving apparatus according to claim 4, further comprising:

a plurality of stator mounting bosses formed at the rear wall of the tub;

a plurality of inner coupling holes formed through the motor mounting bracket such that the plurality of inner coupling holes correspond corresponds to the plurality of stator mounting bosses, respectively; and

a plurality of coupling holes formed at the stator such that the plurality of coupling holes correspond corresponds to the plurality of stator mounting bosses, respectively, and correspond corresponds to the plurality of inner coupling holes, respectively, whereby wherein the stator is

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mounted to the tub ~~when by a plurality of~~ bolts are fastened through the ~~plurality of~~ stator mounting bosses, the ~~plurality of~~ inner coupling holes, and the ~~plurality of~~ coupling holes, in this order.

6. (Currently Amended) The driving apparatus according to claim 1, further comprising:

a positioning unit ~~which device that~~ determines positions of the motor mounting bracket and the stator to be fixed with respect to the tub such that the stator is concentrically coupled to the drum shaft.

7. (Currently Amended) The motor according to claim 6, wherein the positioning ~~unit device~~ includes:

at least one positioning protrusion ~~protruded that protrudes~~ from the tub;

a first positioning hole formed through the motor mounting bracket such that the first positioning hole receives the ~~at least one~~ positioning protrusion; and

a second positioning hole formed through the stator such that the second positioning hole receives the ~~at least one~~ positioning protrusion.

8. (Currently Amended) The driving apparatus according to claim 6, wherein the positioning ~~unit device~~ includes:

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at least one first positioning hole formed at the tub;

~~a at least one~~ second positioning hole formed through the motor mounting bracket such that the ~~at least one~~ second positioning hole corresponds to the ~~at least one~~ first positioning hole; and

~~a at least one~~ positioning protrusion ~~protruded that protrudes~~ from the stator such that the ~~at least one~~ positioning protrusion extends through the ~~at least one~~ first positioning hole and ~~the at least one~~ second positioning holes hole.

9. (Currently Amended) The driving apparatus according to claim 5, ~~further~~ comprising:

~~an wherein the~~ auxiliary bracket which is interposed between the stator and the motor mounting bracket, and is formed with ~~includes~~ a plurality of bolt coupling bosses respectively corresponding to the ~~plurality of~~ stator mounting bosses, the ~~plurality of~~ inner coupling holes, and the ~~plurality of~~ coupling holes.

10. (Currently Amended) The driving apparatus according to claim-9_1, wherein the auxiliary bracket has an annular shape.

11. (Currently Amended) The driving apparatus according to claim-9_1, wherein the auxiliary bracket is made of an aluminum material.

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12. (Currently Amended) The driving apparatus according to claim 9, further comprising:

a positioning unit which device that determines positions of the auxiliary bracket and the stator to be fixed with respect to the tub such that the stator is concentrically coupled to the drum shaft.

13. (Currently Amended) The driving apparatus according to claim 12, wherein the positioning unit device includes:

at least one first positioning hole formed at the tub;

a first positioning pin protruded that protrudes from the auxiliary bracket toward the tub such that the first positioning pin is inserted into the at least one first positioning hole;

a at least one second positioning hole formed through the auxiliary bracket; and

a second positioning pin protruded that protrudes from the stator toward the auxiliary bracket such that the second positioning pin is inserted into the at least one second positioning hole.

14. (Currently Amended) The driving apparatus according to claim 2, wherein the molded member of the stator is provided with includes a reinforcing member for increasing that increases a strength of the molded member.

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15. (Currently Amended) The driving apparatus according to claim 14, wherein the reinforcing member comprises a plurality of reinforcing ribs formed at an outer surface of the molded member such that the plurality of reinforcing ribs ~~are~~ is integral with the molded member.

16. (Currently Amended) A driving apparatus for a washing machine, comprising:
a tub ~~which contains~~ configured to contain washing water, and ~~receives~~ receive a drum such that the drum is rotatable therein;

a dual rotor ~~which that~~ includes an outer rotor including a plurality of magnets supported by an inner peripheral surface of the outer rotor, and an inner rotor arranged inside the outer rotor, the inner rotor including a plurality of magnets supported by an outer peripheral surface of the inner rotor;

a bearing housing ~~which is formed at a rear wall of the tub in accordance with an insert molding method~~ such that the bearing housing is integral with the tub, the bearing housing rotatably supporting a drum shaft ~~conneecting that connects~~ the drum and the dual rotor;

a motor mounting bracket ~~which is mounted to the rear wall of the tub~~; and

a stator ~~which is mounted to the motor mounting bracket such that the stator is arranged between the outer rotor and the inner rotor, the stator generating magnetic energy using electrical energy supplied from an external of the stator, to rotate and rotates the dual rotor, and an auxiliary bracket interposed between the stator and the motor mounting bracket.~~

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17. (Currently Amended) The driving apparatus according to claim 16, wherein the stator includes:

a core arranged such that opposite surfaces of the core face the plurality of magnets of the outer rotor and the plurality of magnets of the inner rotor, respectively;

an insulator made of an insulating material, the insulator enclosing the core;

a plurality of coils wound around the insulator;

a molded member ~~formed in accordance with an insert molding method to enclose that encloses~~ the insulator and the plurality of coils such that the molded member is integral with the insulator and the plurality of coils while allowing the opposite surfaces of the core to be exposed; and

a coupling member ~~extending that extends~~ from the molded member, the coupling portion member being mounted to the rear wall of the tub via the motor mounting bracket.

18. (Currently Amended) The driving apparatus according to claim 16, wherein the stator includes:

a core arranged such that opposite surfaces of the core face the plurality of magnets of the outer rotor and the plurality of magnets of the inner rotor, respectively;

an insulator enclosing the core;

a plurality of coils wound around the insulator; and

a coupling member ~~extending that extends~~ from the ~~molded member~~ insulator, the

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coupling member being mounted to the rear wall of the tub via the motor mounting bracket.

19. (Currently Amended) The driving apparatus according to claim 16, further comprising:

a plurality of bracket mounting bosses formed at the rear wall of the tub; and

a plurality of outer coupling holes formed through the motor mounting bracket such that the plurality of outer coupling holes correspond corresponds to the plurality of bracket mounting bosses, respectively, whereby wherein the motor mounting bracket is mounted to the tub when by a plurality of bolts are fastened through the plurality of bracket mounting bosses of the tub and the plurality of outer coupling holes of the motor mounting bracket.

20. (Currently Amended) The driving apparatus according to claim 19, further comprising:

a plurality of inner coupling holes formed through the motor mounting bracket; and

a plurality of coupling holes formed at the coupling member of the stator such that the plurality of coupling holes correspond corresponds to the plurality of inner coupling holes, respectively, whereby wherein the stator is mounted to the motor mounting bracket when by a plurality of bolts are fastened through the plurality of inner coupling holes and the plurality of coupling holes, in this order.

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21. (Currently Amended) The driving apparatus according to claim 20, further comprising:

~~an wherein the auxiliary bracket which is interposed between the coupling member of the stator and the motor mounting bracket, and is formed with includes a plurality of bolt coupling bosses respectively corresponding to the plurality of inner coupling holes of the motor mounting bracket and the plurality of coupling holes of the stator.~~

22. (Currently Amended) The driving apparatus according to claim 17, wherein the molded member of the stator is provided with ~~includes~~ a reinforcing member for increasing that ~~increases~~ a strength of the molded member.

23. (Currently Amended) The driving apparatus according to claim 22, wherein the reinforcing member comprises a plurality of reinforcing ribs formed at an outer surface of the molded member such that the ~~plurality of~~ reinforcing ribs ~~are~~ ~~is~~ integral with the molded member.

24. (Currently Amended) A driving apparatus for a washing machine, comprising: a tub which contains ~~configured to contain~~ washing water, and receives ~~receive~~ a drum such that the ~~drum~~ ~~drum~~ is rotatable ~~therein~~, the tub including a plurality of bracket mounting bosses formed at a rear wall of the tub, and a plurality of stator mounting bosses formed at the ~~a~~

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rear wall of the tub;

a dual rotor which that includes an outer rotor including a plurality of magnets supported by an inner peripheral surface of the outer rotor, and an inner rotor arranged inside the outer rotor, the inner rotor including a plurality of magnets supported by an outer peripheral surface of the inner rotor;

a bearing housing which is formed at a the rear wall of the tub in accordance with an insert molding method such that the bearing housing is integral with the tub, the bearing housing rotatably supporting a drum shaft connecting that connects the drum and the dual rotor;

a motor mounting bracket which is mounted to the rear wall of the tub, and is formed with that includes a plurality of outer coupling holes respectively corresponding to the plurality of bracket mounting bosses such that a plurality of bolts are is fastened through the plurality of outer coupling holes and the corresponding plurality of bracket mounting bosses, and a plurality of inner coupling holes respectively corresponding to the plurality of stator mounting bosses such that the plurality of bolts are is fastened through the plurality of inner coupling holes and the plurality of stator mounting bosses; and

a stator which that includes a core arranged such that opposite surfaces of the core face the plurality of magnets of the outer rotor and the plurality of magnets of the inner rotor, respectively, an insulator made of an insulating material, the insulator enclosing the core, a plurality of coils wound around the insulator, a molded member formed in accordance with an insert molding method to enclose that encloses the insulator and the plurality of coils such that

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the molded member is integral with the insulator and the plurality of coils while allowing the opposite surfaces of the core to be exposed, and a coupling member extending that extends from the molded member, the coupling portion member being mounted to the rear wall of the tub via the motor mounting bracket; and

an auxiliary bracket interposed between the stator and the motor mounting bracket.

25. (Currently Amended) The driving apparatus according to claim 24, further comprising:

an wherein the auxiliary bracket which is interposed between the coupling member of the stator and the motor mounting bracket, and is formed with wherein the auxiliary bracket includes a plurality of bolt coupling bosses respectively corresponding to the plurality of inner coupling holes of the motor mounting bracket and the plurality of coupling holes of the stator.

26. (Currently Amended) A driving apparatus for a washing machine, comprising:
a tub which contains configured to contain washing water, and receives receive a drum such that the drum is rotatable therein, the tub including a plurality of bracket mounting bosses formed at a rear wall of the tub;

a dual rotor which that includes an outer rotor including a plurality of magnets supported by an inner peripheral surface of the outer rotor, and an inner rotor arranged inside the outer rotor, the inner rotor including a plurality of magnets supported by an outer peripheral surface

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of the inner rotor;

a bearing housing which is formed at a the rear wall of the tub in accordance with an insert molding method such that the bearing housing is integral with the tub, the bearing housing rotatably supporting a drum shaft connecting that connects the drum and the dual rotor;

a motor mounting bracket which is mounted to the rear wall of the tub, and is formed with that includes a plurality of outer coupling holes respectively corresponding to the plurality of bracket mounting bosses such that a plurality of bolts are is fastened through the plurality of outer coupling holes and the corresponding plurality of bracket mounting bosses, and a plurality of inner coupling holes is arranged inside the plurality of outer coupling holes; and

a stator which that includes a core arranged such that opposite surfaces of the core face the plurality of magnets of the outer rotor and the plurality of magnets of the inner rotor, respectively, an insulator made of an insulating material, the insulator enclosing the core, a plurality of coils wound around the insulator, a molded member formed in accordance with an insert molding method to enclose that encloses the insulator and the plurality of coils such that the molded member is integral with the insulator and the plurality of coils while allowing the opposite surfaces of the core to be exposed, and a coupling member extending that extends from the molded member, the coupling portion member being mounted to the motor mounting bracket; and

an auxiliary bracket interposed between the stator and the motor mounting bracket.

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27. (Currently Amended) The driving apparatus according to claim 26, further comprising:

~~an wherein the auxiliary bracket which is interposed between the coupling member of the stator and the motor mounting bracket, and is formed with wherein the auxiliary bracket includes a plurality of bolt coupling bosses respectively corresponding to the plurality of inner coupling holes of the motor mounting bracket and the plurality of coupling holes of the stator.~~

28. (Currently Amended) A driving apparatus for a washing machine, comprising: a tub ~~which contains~~ configured to contain washing water, and ~~receives~~ receive a drum such that the drum is rotatable ~~therein~~, the tub including a plurality of bracket mounting bosses formed at a rear wall of the tub;

a dual rotor ~~which that~~ includes an outer rotor including a plurality of magnets supported by an inner peripheral surface of the outer rotor, and an inner rotor arranged inside the outer rotor, the inner rotor including a plurality of magnets supported by an outer peripheral surface of the inner rotor;

a bearing housing which is formed at ~~a~~ the rear wall of the tub in accordance with an insert molding method such that the bearing housing is integral with the tub, the bearing housing rotatably supporting a drum shaft ~~connecting that connects~~ the drum and the dual rotor;

a motor mounting bracket ~~which is~~ mounted to the rear wall of the tub, and is formed with ~~that includes~~ a plurality of outer coupling holes respectively corresponding to the plurality

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of bracket mounting bosses such that a plurality of bolts are is fastened through the plurality of outer coupling holes and the corresponding plurality of bracket mounting bosses, and a plurality of inner coupling holes arranged inside the plurality of outer coupling holes; and

a stator-which that includes a core arranged such that opposite surfaces of the core face the plurality of magnets of the outer rotor and the plurality of magnets of the inner rotor, respectively, an insulator enclosing the core, a plurality of coils wound around the insulator, and a coupling member-extending that extends from the insulator, the coupling portion member being mounted to the rear wall of the tub via the motor mounting bracket; and

an auxiliary bracket interposed between the stator and the motor mounting bracket.

29. (Currently Amended) The driving apparatus according to claim 28, further comprising:

an wherein the auxiliary bracket which is interposed between the coupling member of the stator and the motor mounting bracket, and is formed with wherein the auxiliary bracket includes a plurality of bolt coupling bosses respectively corresponding to the plurality of inner coupling holes of the motor mounting bracket and the plurality of coupling holes of the stator.

30. (Currently Amended) A driving apparatus for a washing machine, comprising: a tub-which contains configured to contain washing water, and receives receive a drum such that the drum is rotatable therein, the tub including a plurality of bracket mounting bosses

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formed at a rear wall of the tub;

a dual rotor which that includes an outer rotor including a plurality of magnets supported by an inner peripheral surface of the outer rotor, and an inner rotor arranged inside the outer rotor, the inner rotor including a plurality of magnets supported by an outer peripheral surface of the inner rotor;

a bearing housing which is formed at a the rear wall of the tub in accordance with an insert molding method such that the bearing housing is integral with the tub, the bearing housing rotatably supporting a drum shaft connecting that connects the drum and the dual rotor;

a motor mounting bracket which is mounted to the rear wall of the tub, and is formed with that includes a plurality of outer coupling holes respectively corresponding to the plurality of bracket mounting bosses such that a plurality of bolts are is fastened through the plurality of outer coupling holes and the corresponding plurality of bracket mounting bosses, and a plurality of inner coupling holes arranged inside the plurality of outer coupling holes; and

a stator which that includes a core arranged such that opposite surfaces of the core face the plurality of magnets of the outer rotor and the plurality of magnets of the inner rotor, respectively, an insulator enclosing the core, a plurality of coils wound around the insulator, and a coupling member extending that extends from the insulator, the coupling portion member being mounted to the motor mounting bracket; and

an auxiliary bracket interposed between the stator and the motor mounting bracket.

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31. (Currently Amended) The driving apparatus according to claim 30, ~~further comprising:~~

~~an wherein the auxiliary bracket which is interposed between the coupling member of the stator and the motor mounting bracket, and is formed with wherein the auxiliary bracket includes a plurality of bolt coupling bosses respectively corresponding to the plurality of inner coupling holes of the motor mounting bracket and the plurality of coupling holes of the stator.~~